Afghanistan, Burkina Faso, Chad, Congo, Dem. Rep., Ethiopia, Guatemala, Haiti, Kenya, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Somal... - Predicting Food Crises 2020, Dataset for reproducing working paper results

Bo Pieter Johannes Andree, Andres Chamorro, Aart Kraay, Phoebe Spencer, Dieter Wang

Report generated on: November 2, 2020

Overview

Identification

ID NUMBER
WLD_2020_PFC_v01_M

Version

VERSION DESCRIPTION

PRODUCTION DATE
2020-09

Overview

ABSTRACT
Globally, more than 130 million people are estimated to be in food crisis. These humanitarian disasters are associated with severe impacts on livelihoods that can reverse years of development gains. The existing outlooks of crisis-affected populations rely on expert assessment of evidence and are limited in their temporal frequency and ability to look beyond several months. This paper presents a statistical foresting approach to predict the outbreak of food crises with sufficient lead time for preventive action. Different use cases are explored related to possible alternative targeting policies and the levels at which finance is typically

unlocked. The results indicate that, particularly at longer forecasting horizons, the statistical predictions compare favorably to expert-based outlooks. The paper concludes that statistical models demonstrate good ability to detect future outbreaks of food crises and that using statistical forecasting approaches may help increase lead time for action.

TOPICS

Topic	Vocabulary	URI
C01 - Econometrics	Journal of Economic Literature (JEL)	https://www.aeaweb.org/econlit/jelCodes.php
C14 - Semiparametric and Nonparametric Methods: General	Journal of Economic Literature (JEL)	https://www.aeaweb.org/econlit/jelCodes.php
C25 - Discrete Regression and Qualitative Choice Models - Discrete Regressors - Proportions - Probabilities	Journal of Economic Literature (JEL)	https://www.aeaweb.org/econlit/jelCodes.php
C53 - Forecasting and Prediction Methods - Simulation Methods	Journal of Economic Literature (JEL)	https://www.aeaweb.org/econlit/jelCodes.php
O10 - Economic Development - General	Journal of Economic Literature (JEL)	https://www.aeaweb.org/econlit/jelCodes.php

KEYWORDS
Famine, Food Insecurity, Extreme Events, Unbalanced Data, Cost-sensitive learning

Coverage

GEOGRAPHIC COVERAGE
Afghanistan, Burkina Faso, Chad, Democratic Republic of Congo, Ethiopia, Guatemala, Haiti, Kenya, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Somalia, South Sudan, Sudan, Uganda, Yemen, Zambia, Zimbabwe

Producers and Sponsors

PRIMARY INVESTIGATOR(S)

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FUNDING

Name	Abbreviation	Role
State and Peace-Building Trust Fund	SPF	

Metadata Production

METADATA PRODUCED BY

Name	Abbreviation	Affiliation	Role
Development Economics Data Group	DECDG	The World Bank	Documentation of the DDI

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DDI DOCUMENT VERSION
Version 01 (October 2020)

DDI DOCUMENT ID
DDI_WLD_2020_PFC_v01_M

Sampling

No content available

Questionnaires

No content available

Data Collection

Data Collection Dates

Start	End	Cycle
2007	2020	N/A

Time Periods

Start	End	Cycle
2007	2020	N/A

Data Collection Notes

Data compiled from multiple sources, including surveys and satellite imagery

Data Processing

No content available

Data Appraisal

No content available

File Description

Variable List

predicting_food_crises_data

Content	Data set used to produce results of the working paper: Andree, Bo Pieter Johannes; Chamorro, Andres; Kraay, Aart; Spencer, Phoebe; Wang, Dieter. 2020. Predicting Food Crises. Policy Research Working Paper; No. 9412. World Bank, Washington, DC.
Cases	183596
Variable(s)	28
Structure	Type: Keys: ()
Version	
Producer	
Missing Data	

Variables

ID	NAME	LABEL	TYPE	FORMAT	QUESTION
V1	country	Name of country	discrete	character	
V2	admin_code	Admin 2 code	contin	numeric	
V3	admin_name	Name of district	discrete	character	
V4	centx	centroid - longitude (x)	contin	numeric	
V5	centy	centroid - latitude (y)	contin	numeric	
V6	year_month	Year and month	discrete	character	
V7	year	Year	discrete	numeric	
V8	month	Month	discrete	numeric	
V9	fews_ipc	IPC Phase as classified by FEWS NET	discrete	numeric	
V10	fews_ha	Humanitarian Assistance Tag	discrete	numeric	
V11	fews_proj_near	FEWS Near-term projection (3 or 4 months ahead)	discrete	numeric	
V12	fews_proj_near_ha	FEWS Near-term projection Humanitarian Assistance Tag	discrete	numeric	
V13	fews_proj_med	FEWS Medium-term projection (6 or 8 months ahead)	discrete	numeric	
V14	fews_proj_med_ha	FEWS Medium-term projection Humanitarian Assistance Tag	discrete	numeric	
V15	ndvi_mean	Normalized Difference Vegetation Index (NDVI)	contin	numeric	
V16	ndvi_anom	NDVI anomalies	contin	numeric	
V17	rain_mean	Rainfall Estimates from Rain Gauge and Satellite Observations (CHIRPS) - Mean	contin	numeric	
V18	rain_anom	Rainfall Estimates from Rain Gauge and Satellite Observations (CHIRPS) - Anomalies	contin	numeric	
V19	et_mean	Evapotranspiration mean	contin	numeric	
V20	et_anom	Evapotranspiration anomalies	contin	numeric	
V21	acled_count	Count of violent events (ACLED)	contin	numeric	
V22	acled_fatalities	Sum of number of fatalities (ACLED data)	contin	numeric	
V23	p_staple_food	Food Price Index with January 2010 as base month	contin	numeric	
V25	area	Area of district in (sq. mts.)	contin	numeric	
V26	cropland_pct	Percentage occurrence of cropland (FAO)	contin	numeric	
V28	pop	UN-adjusted population count per year	contin	numeric	

V24	ruggedness_mean	Hundreds of metres of elevation difference for grid cells - average	contin	numeric
V27	pasture_pct	Percentage occurrence of pasture (FAO)	contin	numeric

Name of country (country)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: character
Width: 28

Valid cases: 183596
Invalid: 0

Admin 2 code (admin_code)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 4
Decimals: 0
Range: 0-1256

Valid cases: 183596
Invalid: 0

Description

Admin 2 code, can be used to match with a GAUL shapefile

Source of information

Global Administrative Unit Layers (GAUL) - Food and Agriculture Organization (FAO)

Name of district (admin_name)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: character
Width: 25

Valid cases: 183596
Invalid: 0

Source of information

Global Administrative Unit Layers (GAUL) - Food and Agriculture Organization (FAO)

centroid - longitude (x) (centx)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: -91.931396484375-71.4559478759766

Valid cases: 183596
Invalid: 0

Source of information

Global Administrative Unit Layers (GAUL) - Food and Agriculture Organization (FAO)

centroid - latitude (y) (centy)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 17
Decimals: 0
Range: -25.9617004394531-37.0377502441406

Valid cases: 183596
Invalid: 0

Source of information

Global Administrative Unit Layers (GAUL) - Food and Agriculture Organization (FAO)

Year and month (year_month)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: character
Width: 7

Valid cases: 183596
Invalid: 0

Year (year)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: numeric
Width: 4
Decimals: 0
Range: 2007-2020

Valid cases: 183596
Invalid: 0

Month (month)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: numeric
Width: 2
Decimals: 0
Range: 1-12

Valid cases: 183596
Invalid: 0

IPC Phase as classified by FEWS NET (fews_ipc)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: numeric
Width: 1
Decimals: 0
Range: 1-5

Valid cases: 40952
Invalid: 142644

Description

IPC Phase as classified by FEWS NET. Source at the livelihood zone level has been spatially joined to districts using largest spatial overlap rule.

Source of information

FEWS NET

Humanitarian Assistance Tag (fews_ha)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: numeric
Width: 1
Decimals: 0
Range: 0-1

Valid cases: 29722
Invalid: 153874

Description

Tag denoting presence of humanitarian assistance as marked by(!) on FEWS NET maps.

Source of information

FEWS NET

FEWS Near-term projection (3 or 4 months ahead) (fews_proj_near)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: numeric
Width: 1
Decimals: 0
Range: 1-5

Valid cases: 33669
Invalid: 149927

Description

IPC Phase (1 to 5) as classified by FEWS NET in near-term outlooks. Source at the livelihood zone level has been spatially joined to districts using largest spatial overlap rule.

Source of information

FEWS NET

FEWS Near-term projection Humanitarian Assistance Tag (fews_proj_near_ha)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: numeric
Width: 1
Decimals: 0
Range: 0-1

Valid cases: 31583
Invalid: 152013

Description

Tag denoting presence of humanitarian assistance as marked by(!) on FEWS NET near-term projection maps.

Source of information

FEWS NET

FEWS Medium-term projection (6 or 8 months ahead) (fews_proj_med)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: numeric
Width: 1
Decimals: 0
Range: 1-5

Valid cases: 33426
Invalid: 150170

Description

IPC Phase (1 to 5) as classified by FEWS NET in medium-term outlooks. Source at the livelihood zone level has been spatially joined to districts using largest spatial overlap rule.

Source of information

FEWS NET

FEWS Medium-term projection Humanitarian Assistance Tag (fews_proj_med_ha)
File: predicting_food_crises_data

Overview

Type: Discrete
Format: numeric
Width: 1
Decimals: 0
Range: 0-1

Valid cases: 31340
Invalid: 152256

Description

Tag denoting presence of humanitarian assistance as marked by(!) on FEWS NET medium-term projection maps.

Source of information

FEWS NET

Normalized Difference Vegetation Index (NDVI) (ndvi_mean)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 19
Decimals: 0
Range: -0.0426201187074184-0.862342000007629

Valid cases: 183596
Invalid: 0
Minimum: -0
Maximum: 0.9

Description

Normalized Difference Vegetation Index (NDVI) is a measure of the “greenness,” the relative density and health of vegetation, of the earth’s surface. The values range from -1 and +1. Values greater than .1 generally denote increasing degrees in the greenness and intensity of vegetation. Values between 0 and .1 are commonly characteristic of rocks and bare soil, and values less than 0 sometimes indicate clouds, rain, and snow.

Source of information

MODIS (Terra 16-day 250m), processed in Google Earth Engine). Cropland mask (GFSAD), pasture mask (FAO - FGGD)

NDVI anomalies (ndvi_anom)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: -5496.615234375-3790.71337890625

Valid cases: 183596
Invalid: 0
Minimum: -5496.6
Maximum: 3790.7

Description

Anomalies are calculated by dividing the current monthly value by the long-term average for that month, multiplied by 100. Values below 100% represent vegetation cover deficits, above 100% vegetation cover above average. Broadly values between 90% and 110% are considered as being within the range of normal variability.

Source of information

MODIS (Terra 16-day 250m), processed in Google Earth Engine). Cropland mask (GFSAD), pasture mask (FAO - FGGD)

Rainfall Estimates from Rain Gauge and Satellite Observations (CHIRPS) - Mean (rain_mean)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: 0-125.927200317383

Valid cases: 183596
Invalid: 0
Minimum: 0
Maximum: 125.9

Description

CHIRPS incorporates 0.05° resolution satellite imagery with in-situ station data to create gridded rainfall time series for trend analysis and seasonal drought monitoring. CHIRPS data is available at 5 and 10 day accumulations.

Source of information

CHIRPS Pentad, processed in Google Earth Engine). Cropland mask (GFSAD), pasture mask (FAO - FGGD)

Rainfall Estimates from Rain Gauge and Satellite Observations (CHIRPS) - Anomalies (rain_anom)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 17
Decimals: 0
Range: -42.5106506347656-80.8044204711914

Valid cases: 183596
Invalid: 0
Minimum: -42.5
Maximum: 80.8

Description

Anomalies are calculated by substracting the current monthly value from the long-term average for that month.

Source of information

CHIRPS Pentad, processed in Google Earth Engine). Cropland mask (GFSAD), pasture mask (FAO - FGGD)

Evapotranspiration mean (et_mean)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: 0-47.9041900634766

Valid cases: 183483
Invalid: 113
Minimum: 0
Maximum: 47.9

Description

Evapotranspiration is a measurement of the amount of water required for plant growth. The algorithm used for the MOD16 data product collection is based on the logic
of the Penman-Monteith equation, which includes inputs of daily
meteorological reanalysis data along with MODIS remotely sensed data
products such as vegetation property dynamics, albedo, and land cover.

Source of information

Modis (Terra 8-day 500m)

Evapotranspiration anomalies (et_anom)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 17
Decimals: 0
Range: -17.4978504180908-17.113410949707

Valid cases: 183483
Invalid: 113
Minimum: -17.5
Maximum: 17.1

Source of information

Modis (Terra 8-day 500m)

Count of violent events (ACLED) (acled_count)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 3
Decimals: 0
Range: 0-265

Valid cases: 183596
Invalid: 0
Minimum: 0
Maximum: 265

Source of information

Armed Conflict Location & Event Data Project (ACLED)

Sum of number of fatalities (ACLED data) (acled_fatalities)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 4
Decimals: 0
Range: 0-2394

Valid cases: 183596
Invalid: 0
Minimum: 0
Maximum: 2394

Source of information

Armed Conflict Location & Event Data Project (ACLED)

Food Price Index with January 2010 as base month (p_staple_food)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: 0.1973866969347-139.999099731445

Valid cases: 183596
Invalid: 0

Source of information

Food Security and Nutrition Analysis Unit (FSNAU), World Food Programme (WFP)

Area of district in (sq. mts.) (area)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: 10.2975301742554-331292

Valid cases: 183596
Invalid: 0
Minimum: 10.3
Maximum: 331292

Source of information

Hidden Dimension of Poverty Dataset (World Bank)

Percentage occurrence of cropland (FAO) (cropland_pct)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: 0-99.2402496337891

Valid cases: 183596
Invalid: 0
Minimum: 0
Maximum: 99.2

Source of information

Hidden Dimension of Poverty Dataset (World Bank)

UN-adjusted population count per year (pop)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: 2123.30004882812-14050941

Valid cases: 183596
Invalid: 0

Description

UN-adjusted population count per year, interpolation of CIESIN-GPW (GPWv4-adjusted) data - sum of grids

Hundreds of metres of elevation difference for grid cells - average (ruggedness_mean)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: 1339.25805664062-1046065

Valid cases: 183596
Invalid: 0

Source of information

Hidden Dimension of Poverty Dataset (World Bank)

Percentage occurrence of pasture (FAO) (pasture_pct)
File: predicting_food_crises_data

Overview

Type: Continuous
Format: numeric
Width: 16
Decimals: 0
Range: 0-99.5977020263672

Valid cases: 183596
Invalid: 0
Minimum: 0
Maximum: 99.6

Source of information

Hidden Dimension of Poverty Dataset (World Bank)

Documentation

Technical documents

Metadata (list of variables)

Title	Metadata (list of variables)
Date	2020-09-01
Language	English
Filename	metadata.xlsx

Other materials

Predicting Food Crises

Title	Predicting Food Crises
subtitle	Policy Research Working Paper; No. 9412. World Bank, Washington, DC
Author(s)	Andree, Bo Pieter Johannes; Chamorro, Andres; Kraay, Aart; Spencer, Phoebe; Wang, Dieter
Date	2020-09-01
Language	English
Filename	http://hdl.handle.net/10986/34510

Reproducible scripts

Title	Reproducible scripts
Language	English
Filename	predicting_food_crises_R_programs.zip